UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/090,196	03/04/2002	Joseph P. Day	SP01-310 WJT003-0010	4725

22928 7590 02/02/2005

CORNING INCORPORATED
SP-TI-3-1
CORNING, NY 14831

EXAMINER	
NOGUEROLA, ALEXANDER STEPHAN	
ART UNIT	**PAPER NUMBER**
1753	

DATE MAILED: 02/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/090,196	DAY ET AL.	
	Examiner	Art Unit	
	ALEX NOGUEROLA	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 November 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,7-9,12,15-18,21,24,25 and 32-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *41-44* is/are allowed.

6)☒ Claim(s) *1,4,7-9,12,15-18,21,24,25 and 32-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 November 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/04/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicants' amendment of November 06, 2004 does not render the application allowable.

Response to Arguments

2. Applicant's arguments with respect to claims 1, 9, and 17 have been considered but are moot in view of the new grounds of rejection.

Drawings

3. The drawings were received on November 08, 2004. These drawings are accepted.

Status of Objections and Rejections pending since the Office action of June 23, 2004

4. All previous objections and rejections are withdrawn.

Information Disclosure Statement

5. Article C-1 under "Other Documents" on the Information Disclosure Statement of October 04, 2004 has been crossed through because this article has already been cited on the Notice of References Cited mailed on June 23, 2004.

6. Articles C-2 to C-14 listed on the Information Disclosure Statement of October 04, 2004 have not been initialed because they have either not been submitted or have been lost by the Patent Office, as they have not been electronically recorded in the Image File Wrapper for this application. Applicants are requested to resubmit copies of these articles with their response to this Office action.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claim 17 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: means for applying power to the alkali borosilicate glass. The examiner suggests replacing "power to" with -- an electric field across --, as power is actually applied to the electrodes, which generate an electric field, not to the alkali borosilicate glass.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 9 and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by the JPO abstract and Figures 1 and 2 of Yoshinaga (JP 63222254 A) ("Yoshinaga").

Addressing claim 9, Yoshinaga discloses an electrophoresis apparatus comprising a power supply incusing a positive electrode and a negative electrode (see Figure 2 and note that the abstract discloses applying power to the electrodes); and

a buffer tank (10). Note that the buffer tank is *capable* of supporting an alkali borosilicate glass as claimed and is further capable of containing a buffer that covers the glass as claimed. See Figure 2.

Addressing claim 38, Yoshinaga discloses an electrophoresis apparatus comprising a power supply incusing a positive electrode and a negative electrode (see Figure 2 and note that the abstract discloses applying power to the electrodes); and

a buffer tank (10). Note that the buffer tank is *capable* of supporting a sol gel monolith as claimed and is further capable of containing a buffer that covers the monolith as claimed. See Figure 2.

11. Claims 34-37 are rejected under 35 U.S.C. 102(b) as being anticipated by Hay (EP 0327687 A2).

Addressing claim 34, See the abstract (10-80 nm = 100-800 Angstroms, which significantly overlaps Applicants' claimed range and thus anticipates the range in the overlapped portion). Applicants should note that the intended use of the gel for electrophoresis does not, unless shown otherwise, confer any structurally or compositionally limit the inorganic porous materiel, as a large variety of electrophoresis media of different sizes, shapes, and compositions

were known at the time of the invention. In any event, Hay discloses that the inorganic porous material may be used in electrophoresis. See page 2, lines 4-6.

Addressing claims 35 and 36, the type of molecules to be separated are only intended use limitations that, barring a contrary showing, do not further structurally or compositionally limit the inorganic porous material.

Addressing claim 37, this claim introduces a product-by-process limitation that is unpatentable over Hay unless a material different can be shown between the inorganic porous material of Hay and that claimed by Applicants. Furthermore, Hay appears to disclose acid catalyzed hydrolysis. See page 3, lines 5-11.

12. Claims 38-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Audeh (US 4,702,814).

Addressing claim 38, Audeh discloses an electrophoresis apparatus comprising a power supply incusing a positive electrode and a negative electrode (see the abstract and Figure 1); and

a buffer tank (Figure 1). Note that the buffer tank is *capable* of supporting a sol gel monolith as claimed and is further capable of containing a buffer that covers the monolith as claimed. See Figure 1.

Addressing claim 39, the type of molecules to be separated are only intended use limitations that, barring a contrary showing, do not further structurally or compositionally limit the inorganic porous material, *which is not required by claim 38.*

Addressing claim 40, how the monolith was made is irrelevant to patentability since it *is not required by claim 38.*

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

15. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

16. Claims 1, 4, 7, 8, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over MacDonell ("Porous Glass Electrophoresis," *Analytical Chemistry*, vol. 33, no. 11, October 1961, pp. 154-1555) ("MacDonell") as evidenced by the product description of porous glass 7930, which was downloaded from www.corning.com/lightingmaterials/images/vycor_7930.pdf) ("Product Description 7930") in view of the CAPLUS abstract of Herren et al. ("Control of electroosmosis in coated quartz capillaries," Journal of Colloid and Interface Science 91987), 115(1), 46-55) ("Herren"), or CAPLUS abstract of Huang et al. ("Evaluation of surface-bonded polyethylene glycol and polyethylene imine in capillary electrophoresis," Journal of Microcolumn Separations (1992), 4(2), 135-43) ("Huang"), or CAPLUS abstract of Nordt ("Elimination of elecrtoosmotic flow in analytical particle electrophoresis," ACS Symposium Series (1976), 31 (Hydrogels Med. Relat. Appl., Symp., 1975), 225-40) ("Nordt"), or CAPLUS abstract of Vanderhoff et al. ("Development of stable low-electroosmotic mobility coatings," NASA [Contract Rep.] CR (1979), NASA-CR-161244, 15 pp. Avail.: NTIS From:Sci. Tech. Aerosp. Rep. 1979, 17(16), Abstr. No. N79-25180) ("Vanderhoff").

Addressing claim 1, MacDonnell discloses an electrophoretic porous material (abstract), comprising

an alkali borosilicate glass (Corning Code 7930 glass is a borosilicate glass as evidenced by Product Description 7930) that has a plurality of pores therein through which molecules during an electrophoresis process (first column on page 1554 of MacDonell and Figures 1-4).

MacDonell does not mention having the glass coated with a non-charged coating material. Various coatings for glass through which electrophoresis will be performed were known in the art at the time of the invention. See, for example, Herren, Huang, Nordt, and Vcanderhoff. It would have been obvious to one with ordinary skill in the art at the time the invention was made to provide a glass coating as taught by Herren, Huang, Nordt, or Vcanderhoff in the invention of MacDonell because as taught by Herren, Huang, Nordt, and Vcanderhoff an appropriate coating can reduce, eliminate, or stabilize electro-osmotic flow, which would otherwise adversely affect the electrophoretic separation, and will limit adsorption of analytes, such as protein or peptides, onto the glass. See the abstracts.

Addressing claim 4, Product Description 7930 discloses, "homogenous pore diameters can be controlled to average between 40 and 200 Angstroms." Barring a contrary showing, such as unexpected results, selecting the pore size will depend on the sample and was within the skill of one with ordinary skill in the art at the time of the invention. Clearly, for example, the pores should not be smaller than the size of the analytes to be separated.

Addressing claims 7 and 8, it should be first noted that the type of molecules to be separated are only intended use limitations that, barring a contrary showing, do not further structurally limit the inorganic porous material. In any event, electrophoretically separating proteins or nucleic acids through a glass material, such as a capillary, was well known at the time of the invention. Huang is one example of many which could be cited.

Addressing claim 33, Huang and Herren each disclose a polyethylene coating. The choice of coating, to reduce electroosmosis, will depend on the ease of preparation, stability of the coating, whether electroosmosis is to be reduced or eliminated, and the chemical compatability of the coating with the sample and buffer.

17. Claims 9, 12, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the JPO abstract and Figures 1 and 2 of Yoshinaga (JP 63222254 A) ("Yoshinaga") in view of MacDonell ("Porous Glass Electrophoresis," *Analytical Chemistry*, vol. 33, no. 11, October 1961, pp. 154-1555) ("MacDonell") as evidenced by the product description of porous glass 7930, which was downloaded from www.corning.com/lightingmaterials/images/vycor_7930.pdf) ("Product Description 7930"), CAPLUS abstract of Herren et al. ("Control of electroosmosis in coated quartz capillaries," Journal of Colloid and Interface Science 91987), 115(1), 46-55) ("Herren"), or CAPLUS abstract of Huang et al. ("Evaluation of surface-bonded polyethylene glycol and polyethylene imine in capillary electrophoresis," Journal of Microcolumn Separations (1992), 4(2), 135-43) ("Huang"), or CAPLUS abstract of Nordt ("Elimination of elecrtoosmotic

flow in analytical particle electrophoresis," ACS Symposium Series (1976), 31 (Hydrogels Med. Relat. Appl., Symp., 1975), 225-40) ("Nordt"), or CAPLUS abstract of Vanderhoff et al. ("Development of stable low-electroosmotic mobility coatings," NASA [Contract Rep.] CR (1979), NASA-CR-161244, 15 pp. Avail.: NTIS From:Sci. Tech. Aerosp. Rep. 1979, 17(16), Abstr. No. N79-25180) ("Vanderhoff").

Addressing claim 9, Yoshinaga discloses an electrophoresis apparatus comprising a

power supply incusing a

positive electrode and a negative electrode (see Figure 2 and note that the abstract discloses applying power to the electrodes); and

a buffer tank (10). It should be noted that claim 9 does not *require* an alkali borosilicate glass nor a buffer covering the glass as claimed and that the apparatus of Yoshinaga is *capable* of supporting an alkali borosilicate glass as claimed and covering the glass with buffer as claimed. In any event, teaches a electrophoresis medium supported by the buffer tank and covered with a buffer such that molecules migrate within a least a portion of the plurality of pores when power is applied to the positive electrode and the negative electrode both of which are immersed and located at opposite ends of the electrophoresis medium. See the abstract and Figure 2.

Yoshinaga (abstract) only mentions a gel electrophoresis medium, not a glass electrophoresis medium.

MacDonnell discloses an electrophoretic porous material (abstract),

comprising

an alkali borosilicate glass (Corning Code 7930 glass is a borosilicate glass as evidenced

by Product Description 7930) that has a plurality of pores therein through which molecules during an electrophoresis process (first column on page 1554 of MacDonell and Figures 1-4). The porous medium is in the form of a thin slab as is the gel in Yoshinaga and is horizontally oriented, as is the gel in Yoshinaga. Compare Figure 1 of MacDonell with Figure 2 of Yoshinaga.

It would have been obvious to one with ordinary skill in the art at the time the invention was made to place the porous glass of MacDonnell in the electrophoresis apparatus of Yoshinaga because the electrophoresis apparatus of Yoshinaga is for recovering separated analytes and is clearly not limited to porous polymer gels. In fact, the electrophoresis apparatus of Yoshinaga contains a porous glass filter (2) though which molecules pass as power is applied to the positive electrode and the negative electrode. As seen in Figure 2 the electrophoresis medium can be replaced with another electrophoresis medium and thus the electrophoresis apparatus of Yoshinaga is designed to be reused.

MacDonell does not mention having the glass coated with a non-charged coating material. Various coatings for glass through which electrophoresis will be performed were known in the art at the time of the invention. See, for example, Herren, Huang, Nordt, and Vcanderhoff. It would have been obvious to one with ordinary skill in the art at the time the invention was made to provide a glass coating as taught by Herren, Huang, Nordt, or Vcanderhoff in the invention of MacDonell because as taught by Herren, Huang, Nordt, and Vcanderhoff an appropriate coating can reduce, eliminate, or stabilize electro-osmotic flow, which would otherwise adversely affect the electrophoretic separation, and will limit adsorption of analytes, such as protein or peptides, onto the glass. See the abstracts.

Addressing claim 12, Product Description 7930 discloses, "homogenous pore diameters can be controlled to average between 40 and 200 Angstroms." Barring a contrary showing, such as unexpected results, selecting the pore size will depend on the sample and was within the skill of one with ordinary skill in the art at the time of the invention. Clearly, for example, the pores should not be smaller than the size of the analytes to be separated.

Addressing claims 15 and 16, it should be first noted that the type of molecules to be separated are only intended use limitations that, barring a contrary showing, do not further structurally limit the inorganic porous material. In any event, electrophoretically separating proteins or nucleic acids through a glass material, such as a capillary, was well known at the time of the invention. Huang is one example of many which could be cited.

18. Claims 9, 12, 15-18, 21, 24, 25, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable Audeh (US 4,702,814) in view of MacDonell ("Porous Glass Electrophoresis," *Analytical Chemistry*, vol. 33, no. 11, October 1961, pp. 154-1555) ("MacDonell") as evidenced by the product description of porous glass 7930, which was downloaded from www.corning.com/lightingmaterials/images/vycor_7930.pdf) ("Product Description 7930"), CAPLUS abstract of Herren et al. ("Control of electroosmosis in coated quartz capillaries,"

Journal of Colloid and Interface Science 91987), 115(1), 46-55) ("Herren"), or CAPLUS abstract of Huang et al. ("Evaluation of surface-bonded polyethylene glycol and polyethylene imine in capillary electrophoresis," Journal of Microcolumn Separations (1992), 4(2), 135-43) ("Huang"), or CAPLUS abstract of Nordt ("Elimination of elecrtoosmotic flow in analytical particle electrophoresis," ACS Symposium Series (1976), 31 (Hydrogels Med. Relat. Appl., Symp., 1975), 225-40) ("Nordt"), or CAPLUS abstract of Vanderhoff et al. ("Development of stable low-electroosmotic mobility coatings," NASA [Contract Rep.] CR (1979), NASA-CR-161244, 15 pp. Avail.: NTIS From:Sci. Tech. Aerosp. Rep. 1979, 17(16), Abstr. No. N79-25180) ("Vanderhoff").

Addressing claim 9, Audeh discloses an electrophoresis apparatus comprising a power supply incusing a positive electrode and a negative electrode (see Figure 1 and the abstract); and

a buffer tank (Figure 1). It should be noted that claim 9 does not *require* an alkali borosilicate glass nor a buffer covering the glass as claimed and that the apparatus of Audeh is *capable* of supporting an alkali borosilicate glass as claimed and covering the glass with buffer as claimed. In any event, teaches a electrophoresis medium supported by the buffer tank and covered with a buffer such that molecules migrate within a least a portion of the plurality of pores when power is applied to the positive electrode and the negative electrode both of which are immersed and located at opposite ends of the electrophoresis medium. See the abstract and Figure 2.

Audeh only mentions a gel electrophoresis medium, not a glass electrophoresis medium.

MacDonnell discloses an electrophoretic porous material (abstract),

comprising

an alkali borosilicate glass (Corning Code 7930 glass is a borosilicate glass as evidenced by Product Description 7930) that has a plurality of pores therein through which molecules during an electrophoresis process (first column on page 1554 of MacDonell and Figures 1-4). The porous medium is in the form of a thin slab as is the gel in Audeh and is horizontally oriented, as is the gel in Audeh. Compare Figure 1 of MacDonell with Figure 1 of Audeh.

Although Audeh does not mention using porous glass as an electrophoresis medium, Audeh does disclose several possible different gels for use as an electrophoresis medium. See col. 1: 43-58; col. 3:35-40; and col. 2:63 – col. 3:20. The choice of electrophoresis medium from known electrophoresis media is just a matter of optimizing the electrophoresis separation. See col. 2:63 – col. 3:20 and col. 3:35-40 in Audeh. It would have been obvious to one with ordinary skill in the art at the time the invention was made to use the porous glass of MacDonnell in the electrophoresis apparatus of Audeh, instead of gel, because as taught by MacDonell porous glass allows rapid, distinct separation of molecules such as amino acids and dyes and is transparent for easy visualization. See the third full paragraph on page 1555 and the last sentence in the first column on page 1554. Also, since the electrophoresis apparatus of Audeh is designed to circulate buffer too eliminate pH differences between the anode buffer chamber and the cathode buffer chamber (abstract) it so should offer better separation when used with the porous glass than the electrophoresis apparatus of MacDonell.

MacDonell does not mention having the glass coated with a non-charged coating material. Various coatings for glass through which electrophoresis will be performed were known in the art at the time of the invention. See, for example, Herren, Huang, Nordt, and Vcanderhoff. It would have been obvious to one with ordinary skill in the art at the time the

invention was made to provide a glass coating as taught by Herren, Huang, Nordt, or Vcanderhoff in the invention of MacDonell because as taught by Herren, Huang, Nordt, and Vcanderhoff an appropriate coating can reduce, eliminate, or stabilize electro-osmotic flow, which would otherwise adversely affect the electrophoretic separation, and will limit adsorption of analytes, such as protein or peptides, onto the glass. See the abstracts.

Addressing claim 12 and 21, Product Description 7930 discloses, "homogenous pore diameters can be controlled to average between 40 and 200 Angstroms." Barring a contrary showing, such as unexpected results, selecting the pore size will depend on the sample and was within the skill of one with ordinary skill in the art at the time of the invention. Clearly, for example, the pores should not be smaller than the size of the analytes to be separated.

Addressing claims 15 and 16, it should be first noted that the type of molecules to be separated are only intended use limitations that, barring a contrary showing, do not further structurally limit the inorganic porous material. In any event, electrophoretically separating proteins or nucleic acids through a glass material, such as a capillary, was well known at the time of the invention. Huang is one example of many which could be cited.

Addressing claim 17, Audeh discloses a method for analyzing a biological sample, the method comprising the steps of

placing into an electrophoresis apparatus an electrophoresis medium having a plurality of pores located therein (Figure 1 and col. 1:43-58 and col. 2:63 – col. 3:20);

pouring a buffer into the electrophoresis apparatus to immerse the electrophoresis medium (implied by Figure 1, which shows the electrophoresis medium immersed in buffer);

inserting the biological sample into the electrophoresis medium (col. 3:52-56); and

applying power to the electrophoresis medium such that molecules of the biological sample migrate within at least a portion of the plurality of pores formed within the electrophoresis medium (col. 3:49-56).

Audeh only mentions a gel electrophoresis medium, not a glass electrophoresis medium.

MacDonnell discloses an electrophoretic porous material (abstract),

comprising

an alkali borosilicate glass (Corning Code 7930 glass is a borosilicate glass as evidenced by Product Description 7930) that has a plurality of pores therein through which molecules during an electrophoresis process (first column on page 1554 of MacDonell and Figures 1-4). The porous medium is in the form of a thin slab as is the gel in Audeh and is horizontally oriented, as is the gel in Audeh. Compare Figure 1 of MacDonell with Figure 1 of Audeh.

Although Audeh does not mention using porous glass as an electrophoresis medium, Audeh does disclose several possible different gels for use as an electrophoresis medium. See col. 1: 43-58; col. 3:35-40; and col. 2:63 – col. 3:20. The choice of electrophoresis medium from known electrophoresis media is just a matter of optimizing the electrophoresis separation. See

col. 2:63 – col. 3:20 and col. 3:35-40 in Audeh. It would have been obvious to one with ordinary skill in the art at the time the invention was made to use the porous glass of MacDonnell in the electrophoresis apparatus of Audeh, instead of gel, because as taught by MacDonell porous glass allows rapid, distinct separation of molecules such as amino acids and dyes and is transparent for easy visualization. See the third full paragraph on page 1555 and the last sentence in the first column on page 1554. Also, since the electrophoresis apparatus of Audeh is designed to circulate buffer to eliminate pH differences between the anode buffer chamber and the cathode buffer chamber (abstract) it so should offer better separation when used with the porous glass than the electrophoresis apparatus of MacDonell.

MacDonell does not mention having the glass coated with a non-charged coating material. Various coatings for glass through which electrophoresis will be performed were known in the art at the time of the invention. See, for example, Herren, Huang, Nordt, and Vcanderhoff. It would have been obvious to one with ordinary skill in the art at the time the invention was made to provide a glass coating as taught by Herren, Huang, Nordt, or Vcanderhoff in the invention of MacDonell because as taught by Herren, Huang, Nordt, and Vcanderhoff an appropriate coating can reduce, eliminate, or stabilize electro-osmotic flow, which would otherwise adversely affect the electrophoretic separation, and will limit adsorption of analytes, such as protein or peptides, onto the glass. See the abstracts.

Addressing claim 18, staining the sample and photographing the migrated molecules was a known detection technique at the time of the invention and, in fact, was used by MacDonell with the porous glass. See Figure 2. Barring a contrary showing, the choice of electrophoresis

detection technique from known detection techniques will depend on factors such as the amount of information required, such as measure of concentration or just identification; degree of resolution, such as nucleic acid base sequencing; and selectivity of available stains. Using stains and photography is a simple, inexpensive technique for recognizing separated analytes of interest compared with using a complicated optical laser detection system that requires chemical labeling of the sample components.

Addressing claims 24 and 25, Audeh discloses electrophoresising nucleic acids and proteins. See col. 1:59-66. It should be noted that porous glass of MacDonnell was used to separate amino acids. See Figure 2. Barring a contrary showing, one with ordinary skill in the art would select an electrophoresis medium that is adequate or optimal for the sample components of interest.

Addressing claim 32, one of the strengths of electrophoresis in general is that can be used to analyse very small amounts of sample. MacDonell, for example, discloses a sample range of between 1 and 5 μl. See the third column on page 1554. Also, since, as discussed in the rejection of claim 18, above, the combination of references also discloses staining and photographing the separated sample, the combination of cited references discloses a microscale total analysis system.

Allowable Subject Matter

19. Claims 41-44 are allowed.

20. The following is a statement of reasons for the indication of allowable subject matter:

a) Claim 41 requires "pouring a buffer into the electrophoresis apparatus to immerse the sol gel monolith" and "inserting the biological sample into the sol gel monolith." Hay only broadly discloses using his sol gel for electrophoresis. See page 2, lines 1-6. He does not suggest how to use the monolith, such as immersing the monolith in buffer, or samples suitable for the sol gel monolith; and

b) Claims 42-44 depend from allowable claim 41.

Final Rejection

21. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEX NOGUEROLA whose telephone number is (571) 272-1343. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NAM NGUYEN can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alex Noguerola
Primary Examiner
AU 1753
January 13, 2005